

CLAIMS LISTING

1. (Currently Amended) An assembly for forming a high speed signal path between first and second daughter boards, for conducting an electronic signal, the assembly comprising:
- a substrate having first and second surfaces;
 - a first daughter boards disposed proximate the first surface of the substrate;
 - a second daughter boards disposed proximate the first surface of the substrate;
 - first and second through-holes within the substrate, each through-hole having a first opening at the first surface and a second opening at the second surface;
 - a first conductive element disposed within the first through-hole and extending from the first surface to the second surface to form a first conductive via having first and second ends;
 - a second conductive element within the second through-hole and extending from the first surface to the second surface to form a second conductive via having first and second ends;
 - a first signal path electrically coupling the first daughter board to the first conductive element in the first through-hole;
 - a second signal path electrically coupling the second daughter board to the second conductive element in the second through hole;
 - an electronic cable having a first end and a second end, the first end of the electronic cable being inserted into the ~~second~~first end of the first conductive via and in electrical contact with the first conductive via, the second end of the electronic cable being inserted into the ~~first~~second end of the second conductive via and in electrical contact with the second conductive via.

1 2. (Cancel)

1 3. (Withdrawn) The assembly of claim 2 further comprising a first conductive plating
2 disposed about an interior surface of the substrate that defines the first through-hole and a
3 second conductive plating disposed about an interior surface of the substrate that defines
4 the second through-hole, and wherein the first electronic cable includes a first conductor
5 having a first end disposed in electrical contact with the first conductive plating and a
6 second end disposed in electrical contact with the second conductive plating.

1 4. (Withdrawn) The assembly of claim 3 wherein the first conductor is soldered to the first
2 conductive plating.

1 5. (Withdrawn) The assembly of claim 3 wherein the first through-hole is filled with
2 conductive material.

1 6. (Withdrawn) The assembly of claim 3 wherein the first through-hole is adapted to
2 receive a conductive pin that extends from a circuit board connector of the first circuit
3 board.

1 7. (Withdrawn) The assembly of claim 3 further comprising a conductive pin secured
2 within the first through-hole and projecting out of the first through-hole to enable
3 connection with a female connector of the first circuit board.

1 8. (Withdrawn) The assembly of claim 7 wherein the first and second-through holes
2 extend between first and second parallel surfaces of the substrate, the conductive pin

projecting out of the first through-hole at the first surface, and the first end of the electronic cable entering the first-through hole at the second surface.

9. (Withdrawn) The assembly of claim 1 wherein the electronic cable comprises a coaxial cable having a center conductor and having an outer conductor disposed concentrically about the center conductor.

10. (Withdrawn) The assembly of claim 1 wherein the first electronic cable comprises:
a pair of wires that extend parallel to one another along the length of the first electronic cable;
an insulating material disposed about the pair of wires; and
a conductive shield disposed about the insulator.

11. (Withdrawn) The assembly of claim 1 wherein the first electronic cable comprises a twisted pair of insulated wires.

12. (Withdrawn) The assembly of claim 2 wherein the first and second regions each include a plurality of other through-holes, and wherein the assembly further comprises a plurality of other electronic cables extending from the first region to the second region, each of the plurality of other electronic cables having a first end disposed in a respective one of the other through-holes in the first region and a second end disposed in a respective one of the other through-holes in the second region.

13. (Withdrawn) The assembly of claim 11 wherein each of the plurality of other electronic cables comprises a coaxial cable.

- 1 14. (Withdrawn) The assembly of claim 11 wherein each of the plurality of other electronic
2 cables comprises a pair of wires disposed within an insulator and a shield disposed about
3 the insulator.
- 1 15. (Withdrawn) The assembly of claim 11 wherein each of the plurality of other electronic
2 cables comprises a twisted pair of insulated wires.
- 1 16. (Withdrawn) The assembly of claim 1 wherein the first and second regions are disposed
2 on a first planar surface of the substrate, and wherein the first electronic cable includes a
3 first conductor that extends through the first through-hole to the first planar surface of the
4 substrate.
- 1 17. (Withdrawn) The assembly of claim 16 wherein the first conductor comprises a first end
2 disposed parallel to the first planar surface to receive a mating contact that extends from a
3 circuit board connector of the first circuit board.
- 1 18. (Withdrawn) The assembly of claim 17 wherein the first conductor extends through the
2 second through-hole and comprises a second end disposed parallel to the first planar
3 surface to receive a mating contact that extends from a circuit board connector of the
4 second circuit board.
- 1 19. (Withdrawn) The assembly of claim 17 wherein the first electronic cable further
2 includes a second conductor that extends through the first through-hole to the first planar
3 surface of the substrate, the second conductor having a second end disposed parallel to the
4 first flat end.

1 20. (Withdrawn) The assembly of claim 17 wherein the first end is disposed substantially
2 flush with the first planar surface.

1 21. (Withdrawn) The assembly of claim 17 wherein the first end has a substantially flat
2 surface that is perpendicular to an axis of extension of the first conductor.

1 22. (Withdrawn) The assembly of claim 17 further comprising a dielectric disposed over the
2 first end of the first conductor to establish a capacitive coupling between the first conductor
3 and the mating contact that extends from the circuit board connector.

1 23. (Withdrawn) The assembly of claim 22 wherein the dielectric has a thickness and
2 dielectric constant selected to achieve a desired capacitance between the first conductor and
3 the mating contact that extends from the circuit board connector.

1 24. (Withdrawn) The assembly of claim 1 wherein the first and second regions are disposed
2 on a first planar surface of the substrate, and wherein the first electronic cable includes a
3 first conductor that extends within the first through-hole to a selected depth relative to the
4 first planar surface.

1 25. (Withdrawn) The assembly of claim 1 wherein the first and second regions are disposed
2 on a first planar surface of the substrate, and wherein the first electronic cable includes a
3 first conductor that extends within the first through-hole and has a substantially flat end
4 recessed relative to the first planar surface to receive a mating contact that extends into the
5 first through-hole.

1 26. (Withdrawn) The assembly of claim 1 wherein the first and second regions are disposed
2 on a first planar surface of the substrate, and wherein the first electronic cable includes a
3 first conductor that extends through the first through-hole and projects out of the first
4 through-hole at a first end, the first end being substantially flat end to receive a mating
5 contact of a circuit board connector of the first circuit board.

1 27. (Withdrawn) The assembly of claim 1 wherein the substrate has conductive traces
2 disposed thereon.

1 28. (Withdrawn) The assembly of claim 27 wherein the substrate comprises a plurality of
2 layers including a first layer having an interior surface disposed in contact with an interior
3 surface of another of the layers, and wherein at least a portion of the plurality of conductive
4 traces are disposed on the interior surface of the first layer.

1 29. (Withdrawn) The assembly of claim 1 wherein the substrate comprises first, second and
2 third component substrates, the first component substrate having first and second openings
3 that define the first and second regions, respectively, and the second and third component
4 substrates being disposed in the first and second openings, respectively, the first through-
5 hole being disposed in the second component substrate and the second through-hole being
6 disposed in the third component substrate.

1 Claims 30-83 (Cancelled)

1 84. (Previously Presented) The assembly of claim 1 wherein the electronic cable is selected
2 from among a group of cables consisting of single conductor cables and dual-conductor

3 cables, and combinations thereof.

1 85. (Currently Amended) The assembly of claim ~~84~~1 wherein ~~a dual conductor~~the
2 electronic cable is a dual conductor cable selected from among a group of dual-conductor
3 cables consisting of twin-axial cables, coaxial cables, twisted pair cables, and combinations
4 thereof.

1 86. (Previously Presented) The assembly of claim 1 wherein the first end of the electronic
2 cable is electrically coupled to the first via proximate the first opening of the first through-
3 hole to mitigate signal reflection.

1 87. (Currently Amended) The assembly of claim 85 wherein the dual conductor cable
2 comprises a first conductor and a second conductor~~conductors~~conductor that are equal in length
3 from respective first ends to respective second ends.

1 88. (Previously presented) The assembly of claim 87 wherein the first ends of the first and
2 second conductors of the dual conductor cable are cut perpendicular to their respective
3 lengths.

1 89. (Previously presented) The assembly of claim 1 wherein the substrate comprises a
2 plurality of layers.

1 90. (Previously presented) The assembly of claim 1 wherein the substrate comprises at least
2 one conductive trace.

1 91. (Previously presented) The assembly of claim 90 wherein said at least one conductive
2 trace includes a conductive trace coupled to ground potential.

1 92. (Previously presented) The assembly of claim 90 wherein said at least one conductive
2 trace includes a conductive trace coupled to a source voltage.

1 93. (Previously Presented) The assembly of claim 1 wherein the first end of the electronic
2 cable is secured within the first conductive via by a securing engagement selected from
3 among a plurality of securing engagements consisting of solder, press fitted ends,
4 frictionally secured ends, retaining hardware, and combinations thereof.

1 94. (Currently Amended) An assembly for forming a high speed signal path between first
2 and second daughter boards, the assembly comprising:

1 a substrate having first and second surfaces;

2 a first daughter board disposed proximate the first surface of the substrate;

3 a second daughter board disposed proximate the first surface of the substrate;

4 first and second through-holes within the substrate, each through-hole having a first

5 opening at the first surface and a second opening at the second surface;

6 a first conductive element disposed within the first through-hole and extending from the

7 first surface to the second surface to form a first conductive via;

8 a second conductive element within the second through-hole and extending from the first

9 surface to the second surface to form a second conductive via;

10 an electronic cable having a first and second ends, the first end of the electronic cable being

11 | inserted into the ~~first~~second end of the first through-hole and in electrical contact
12 | with the first conductive via, and the second end of the electronic cable inserted into
13 | the ~~first~~second end of the second through-hole and in electrical contact with the
14 | second conductive via;
15 | ~~a first electronic member coupled to the first conductive via; and~~
16 | ~~a second electronic member coupled to the second electronic via.~~

1 95. (Previously presented) The assembly of claim 94 wherein the first electronic member
2 comprises a first daughter board having a conductive path conductively coupled to the first
3 conductive via.

1 96. (Previously presented) The assembly of claim 95 further comprising a conductive pin
2 having first and second ends, the first end of the conductive pin sized to fit into the second
3 end of the first through-hole, and configured to electrically engage the first conductive via,
4 and the second end of the pin conductively coupled to the first conductive path.

1 97. (Previously presented) The assembly of claim 96 wherein the daughter board further
2 comprises a conductive engagement member for mechanically and electrically coupling the
3 first conductive path to the conductive pin, the conductive engagement member having a
4 distal end coupled to the first conductive path, and a proximal end having a mechanical
5 capture to releasably engage to the second end of the conductive pin.

1 98. (Currently amended) The assembly of claim 95 further comprising an edge connector
2 with parallel first and second sides, the edge connector being secured to the substrate,

3 | wherein the first daughter board is fixably secured between the parallel first and second
4 | sides of the edge connector.